CHAPTER 5: CONFORMITY EFFECTS ON TRANSPORTATION AND AIR QUALITY PLANS

LINKING TRANSPORTATION AND AIR QUALITY PLANNING:

IMPLEMENTATION OF THE TRANSPORTATION CONFORMITY REGULATIONS IN 15 NONATTAINMENT AREAS

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Chapter 5

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The conformity regulations anticipated four strategies by which transportation and air quality plans can be influenced, either early in the planning process to ensure that conformity will be passed or later to correct problems that have occurred. Areas may:

- craft transportation plans/programs to take account of air quality impacts in selecting project locations and alignments and to include projects with air quality benefits,
- adjust transportation plans/programs by changing project design or timing or by removing projects that generate excess emissions,
- alter SIP emission budgets by trading with stationary and/or area sources or by recalculating mobile source budgets with updated assumptions,
- add control measures to the SIP (e.g., TCMs or mobile source technology measures like inspection and maintenance or reformulated gasoline) to free up room in the budget for VMT growth.

This chapter discusses the extent to which study sites have used these options to deal with conformity difficulties, analyzes the barriers to their use, and explores the alternate strategies areas have employed to solve conformity problems.

Effects of Conformity on Transportation Plans and Programs

Prior to the CAAA of 1990 and ISTEA, state DOTs and MPOs tended to view transportation primarily through the lens of personal mobility and/or area economic development goals. This often resulted in a transportation system that supported the increasing movement of people and goods, while minimizing congestion, through provision of new roads and, to a lesser degree, transit. The CAAA and ISTEA tried to force a sea change in this process by making transportation planners also focus on air quality as a goal. To achieve this goal, while continuing to provide the mobility necessary to maintain economic objectives as well, planners would have to examine alternatives to highway capacity and the use of single-occupant vehicles.

Although clearly transportation planners have become much more aware of and accountable for the impacts of transportation on air quality, it is too early to draw conclusions about the full impact of these laws – and particularly the conformity requirement – on metropolitan transportation systems. As will be described below, conformity has had significant substantive impacts in a few of the 15 study sites, particularly those that are growing rapidly in population and aggregate amounts of personal travel; in others, major changes in transportation plans/programs in response to air quality objectives did not materialize during

the study period.

Firm conclusions about conformity impacts on transportation plans/programs are premature because of the dynamics of transportation planning and project development. The conformity regulations presume that air quality considerations will be taken into account from early project planning through development of an area's overall transportation plan/program. At the final adoption stage, if the conformity tests cannot be passed, the transportation plan/program can be altered to solve the problem by dropping, scaling back, or exploring alternatives to major capacity expansion projects, or by adding air quality beneficial projects.

Because this study covers only the initial four years of implementing the 1993 conformity rule, however, it could not gauge conformity's ultimate impacts. The regulations were not in effect during the *formative* years for many of the projects in transportation plans/programs that were subject to conformity during the study. This formative period preceded enactment of the CAAA in 1990 and ISTEA in 1991, as well as the promulgation of the conformity regulations in 1993. Projects thus in the pipeline for years were not conceived in or evaluated by the processes established through the CAAA and ISTEA. Some of these projects were grandfathered before the 1993 regulations took effect, and others were included in transportation plans/programs during early implementation of the 1993 regulations. In effect, the conformity regulations were applied to the *final* stages of planning. It is not surprising, therefore, that the effects of conformity have been felt more clearly in the planning *process* discussed in Chapter 4 than in the substance of the plans themselves. Nonetheless, the patterns that can be discerned from the study are worth noting.

Effects on Highway Projects

Interim Conformity. During the period in 1991-1993 that the interim conformity guidance was in effect, although there was considerable initial uncertainty about what this unfamiliar procedure entailed and how it had to be documented, most MPOs experienced relatively little difficulty demonstrating conformity against this standard. In many regions, plans and TIPs included traffic flow improvements and other system management measures that promised to reduce congestion, increase speeds, and thus reduce emissions of VOCs and CO.

In some study sites (e.g., New York City, northern New Jersey, Chicago, and Baltimore), as well as in national forums, environmental advocacy groups disputed the validity of these projections, arguing that because transportation demand models lacked feedback loops to show the impacts of highway capacity enhancements on travel behavior, the true emission impacts of these infrastructure investments were not being identified. They also pointed out other flaws in the analytic tools used by most MPOs – e.g., that models lacked sufficient geographic detail to capture the impact of many relatively small projects on regional emissions.[1]

[1]See Arnold M. Howitt, Joshua P. Anderson, and Alan A. Altshuler, "The New Politics of Clean Air and Transportation" (Cambridge, MA: Kennedy School of Government, Harvard University, November 1994),

At the national level, such critiques helped shape the content of the 1993 conformity regulations. Other than encouraging some MPOs to begin adding to their analytic staffs, however, they had only minor impacts on the areas under study. In Baltimore, for example, consideration of the challenge to MPO modeling practices jointly raised by the Chesapeake Bay Foundation and the Environmental Defense Fund merely temporarily delayed the area's conformity determination.

The only major conformity effect found in the study sites during this period resulted not because area transportation agencies had difficulty satisfying the requirements of the interim conformity guidance, but because they anticipated a more stringent final federal rule. In Denver, environmental advocacy groups strongly criticized a non-federal project proposed by a public toll authority – the E-470 segment of a circumferential roadway. The advocacy groups contended it would open new land to development, creating more PM_{10} emissions than planners were forecasting. Other transportation agencies sought assurances that E-470 would not jeopardize the area's ability to demonstrate conformity in the future. Project sponsors eventually agreed to certain specific mitigation measures and created an escrow fund to finance additional mitigation, if that proved necessary.

THE 1993 CONFORMITY REGULATIONS. Table 5-1 shows recent population and VMT growth data for the 15 study sites, dividing them into "high" and "low" growth areas. Conformity's impacts on highway projects have been felt primarily in a number of the high growth areas – Atlanta, Charlotte, Denver, Houston, Salt Lake City – which found passing conformity's emission budget tests most problematic during the study period.

Of the other high growth areas, Phoenix averted conformity difficulties during the study period by aggressively adopting enhanced inspection and maintenance and fuel controls to reduce mobile source pollution but may encounter conformity problems in the future given its growth rate and road building plans. By the end of the study period, Phoenix had been bumped up to higher classifications for ozone, CO, and PM_{10}. Portland, which has far less serious ozone nonattainment problems than the other high growth areas, has had the nation's most stringent growth management regulations in place since the early 1970s and, because it has chosen to invest in rail transit, has comparatively modest highway capacity expansion plans.

Except for Portland, the high growth areas in the study tend to have substantial ongoing land development and significantly rising levels of VMT (which has often proved higher than anticipated at the beginning of the study period). As a consequence, they typically have major highway capacity expansion plans. These areas generally have transit systems with much smaller mode shares than the typical low growth area in the study – and their population and economic growth is primarily occurring at the peripheries of the metropolitan area where

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pp. 24-25. Also available under the same title (Washington, DC: US Department of Transportation, FHWA-PD-97-010 and DOT-VNTSC-FHWA-97-5, February 1997), pp. 27-28.

Table 5-1

POPULATION AND VMT GROWTH RATES, BY HIGHER- AND LOWER-GROWTH STUDY SITES

	Percent Annual Population Growth ('90-'95)	Percent Annual VMT Growth ('90-'95 or '90-'96)	Daily VMT Per Capita ('95 or '96)[b]
Higher-Growth Areas			
Atlanta	2.7%	4.4%	34.6
Phoenix	2.7%	2.8%	22.2
Denver	2.4%	4.5%	24.4
Salt Lake City	2.3%	4.3%	25.3
Houston	2.2%	3.2%	25.4
Charlotte	2.1%	4.9%	24.2
Portland	2.1%	1.9%	17.2
Lower-Growth Areas			
San Francisco	0.9%	1.8%	19.6
Chicago	0.8%	2.0%	18.4
Baltimore	0.7%	2.3%	23.0
No. New Jersey	0.5%	0.6%[a]	24.7
Milwaukee	0.5%	1.7%	20.2
Boston	0.3%	1.2%	12.2
New York	0.1%	-0.2%[c]	11.5
Philadelphia	0.0%	1.4%	17.3

[a]1990-1999 rate

[b]1996 per capita rates calculated using 1995 population data.

[c]NYMTC does not regard negative VMT growth in this period as indicative of future trends.

The sources of data for this table are reported in Appendix IV.

providing high quality transit service is problematic. On the air quality side, these areas, with the exception of Houston, have less severe ozone problems than the low growth areas in the study. Thus, because they have earlier attainment deadlines, they must show required reductions, net of VMT growth, more rapidly than the low growth areas.

Prior to promulgation of the 1993 conformity regulations and in the early phases of implementation, the looming possibility of conformity problems encouraged some of these areas to push as many highway projects as possible through the NEPA process to grandfather them. Thus, if and when a lapse occurred, they would be able to continue to build for at least two or three years before feeling the full sting of interrupted highway funding. Salt Lake City adopted this strategy in anticipation of a conformity lapse in 1994. In Charlotte, although no unusual effort was made to grandfather projects, the area was able to continue under a conformity lapse during all of 1997 with only three projects delayed.

When conformity problems did develop, Denver and Salt Lake City, as will be discussed in the air planning section of this chapter, were able to resolve their conformity problems by altering their air plans or emission budgets and therefore did not have to make significant changes in their transportation plans. In Houston, however, conformity problems in 1994 led to reconfiguration of the Grand Parkway, a planned third circumferential expressway, which was scaled back in lanes and capacity.[2] In Charlotte, planners and policy officials, unable to avert a conformity lapse in early 1997, were struggling to find ways of solving the problem, with no clear path to resolution apparent.

Atlanta has most severely felt the impact of conformity on highway planning. In the early days of conformity implementation, the northern arc of the Outer Loop was stopped from moving into the TIP, and many local observers now doubt it will ever be built. Later, anticipating a conformity lapse at the end of 1997, Atlanta rushed to complete NEPA reviews of more than 100 projects (some of which were major highway expansion projects) so they could be grandfathered. Because FHWA had not completed NEPA review or screened them out as ineligible by the end of 1997, more than 60 projects were not included in the interim transportation improvement program (ITIP) proposed before the lapse. Amidst outcries from environmental groups, EPA raised objections to six of the projects that did get into the proposed ITIP. It argued that, although the projects came from a previously conforming plan, that plan had been based on outdated assumptions. Because these projects had the potential to increase SOV capacity and thus emissions, EPA felt they should not be allowed during the lapse. FHWA disagreed with this position, which set off an interagency dispute that was ultimately resolved in consultation with the White House Council on Environmental Quality. An agreement was brokered among the regional

[2]At the end of the study period, with its NO_x waiver expired, Houston was anticipating further conformity problems to develop – with as yet unknown impacts on its transportation plans.

administrators of EPA, FTA and FHWA in which two of the five (including Georgia SR 400) were limited to design and other preparation work until a conforming plan can be developed. Another project was removed from the ITIP by the MPO.

By contrast, implementation of the conformity rule has had far less impact on transportation plans/programs in the older, relatively low growth metropolitan areas in the study – Chicago, New York, Baltimore, Boston, Philadelphia, Milwaukee, northern New Jersey, and San Francisco. So far, these areas have generally not experienced significant difficulty passing conformity emissions tests (with the exception, in some cases, of the build/no build test). Although these areas typically have more serious pollution problems, they generally have mature highway infrastructure networks, well established transit systems, and relatively slow VMT growth. As a result, many projects in their transportation plans/programs have neutral or positive air quality benefits. These include reconstruction and maintenance of the roadway system and most investments in transit. In these areas, projects that expand road capacity are often traffic flow improvements that relieve congestion but do not increase speeds enough to adversely affect NOx emissions. Due to slow growth rates, emissions from increased VMT are more than offset by fleet turnover and the technology-based mobile source measures (such as enhanced I/M and RFG) required by the CAAA in serious and severe ozone areas. Thus, conformity has not required major adaptations of transportation plans in these areas because there are few major capacity expansions on the table, the mix of projects already includes many with air quality benefits, and technology measures are being adopted in the SIP. In the absence of attainment demonstrations for these areas, the emissions budgets that they must meet come from 15% VOC reduction SIPs and subsequent RFP SIPs. Moreover, at the end of the study period, some had not yet determined conformity against 1999 RFP levels. Because a number of these areas have relatively severe pollution problems, some may develop future conformity difficulties as attainment demonstrations are developed – and as the new ozone and particulate standards are implemented.

INSTITUTIONAL AND POLITICAL FACTORS IN REVISING TRANSPORTATION PLANS AND PROGRAMS. How Charlotte and Atlanta will resolve their lapse problems is not clear at this writing. While it is possible that major changes will be required in their transportation plans, that outcome is by no means certain. What these situations and other less dramatic cases in the study suggest, however, is how difficult institutionally and politically it is for MPOs and state DOTs to make such changes.

As noted above, the conformity regulations presume that at the final adoption stage, if the conformity tests cannot be passed, the transportation plan/program can be altered to solve the problem by dropping, scaling back, or exploring alternatives to major capacity expansion projects, or by adding air quality beneficial projects. This view oversimplifies the transportation planning process, implying a greater degree of centralized decision making – both temporal and institutional – than actually exists. It does not fully take into

account the way in which policy and political consensus on the projects that comprise transportation plans is built over a long period of time, through negotiation and bargaining among many and diverse interests inside and outside of government.

MPOs are not autonomous, hierarchical, executive-driven entities that crisply make and carry out decisions. They are representative bodies whose voting members (typically elected officials or appointed representatives of local governments) are episodically involved and have primary interests in and loyalties to other institutions and/or the communities they represent. True "regional" interests are few. Even major projects like turnpikes or international airports have differential sub-regional impacts which divide decision makers; and these projects are always competitive with – and frequently subordinate to – more narrowly focused, more geographically-parochial concerns.

Initial backing to place a project in a regional transportation plan usually comes from individual localities or major transportation operating agencies that wish to address a specific local need or problem, frequently economic or land development. In larger metropolitan areas, notably New York and Chicago, there are formal sub-regional processes for developing plans and allocating funds; in a number of other areas (e.g., San Francisco and Atlanta) *de facto* sub-regional processes exist. Broader support is then built at the regional and state levels as projects move through the MPO and DOT selection processes. Along the way, popular support, as well as that of developers and myriad other interests that will benefit from the project amass behind project plans. The full process typically takes years, sometimes decades for major projects. Additionally, there are often functional or political inter-relationships among projects that make it difficult to alter or delete one without affecting others. Thus, because "project selection" is not the result of a small group of policy makers acting at a single decision point, it cannot be easily modified or reversed. Disaggregating the final package of projects that appear in a regional transportation plan or program is politically complicated and time consuming, as recent experience in Charlotte and Atlanta clearly illustrates.

A number of forces are thus typically at play to keep highway projects from being changed significantly. Political support for highway capacity expansion tends to be high. In many of these areas, suburban interests, which favor projects that expand highway capacity in their areas over transit or other TCMs, have a majority on MPO boards. Second, even if MPO boards are willing to curb highway expansion, they do not have control over land use decisions that sometimes drive transportation decisions. For example, in Atlanta, the MPO could not stop Gwinnett County's decision to build the Mall of Georgia but does have the responsibility to provide transportation infrastructure to support it.[3] Third, some of these areas have developed modeling results showing that major highway projects reduce emissions because they relieve

[3]The MPO board could have voted against the Mall of Georgia but realized that the project would go ahead, even without board approval. It therefore decided to support the project on the assumption that the board would then be in a better position to ask for some concessions from the developers.

congestion and offer more direct routes to motorists' destinations. Such results were obtained for the outer loop project in Charlotte in the period prior to that area's conformity lapse. Finally, air agencies, perceiving a significant disparity in political influence with governors and legislatures compared to state transportation agencies, are sometimes hesitant to raise strong objections to specific highway projects.

Given the difficulty of extricating projects from plans, and the length of time that will elapse before projects in the pre-ISTEA pipeline are exhausted, it is not surprising that major changes in the contents of regional transportation plans have been few. The effects of conformity on the contents of transportation plans/programs will not be fully felt until/unless air quality goals are systematically considered early in project planning cycles.

There are some indications that this is starting to occur. In the study sites, it appears that, as a result of conformity, proposals for major highway capacity enhancement, while not precluded, are less likely to move into preliminary planning phases than they might have previously if they seem likely to be "emission budget busters." (Some transportation planners report that new project ideas are subjected to an air quality "laugh test.") Those projects that move into the next stages of transportation planning – e.g., generating major investment studies (MIS) – are likely to get earlier and more intensive scrutiny for air quality effects than an earlier generation of projects would have.

Because major highway projects may threaten *financial* as well as emissions budgets, moreover, this effect is strongly reinforced by the fiscal constraint requirement of ISTEA. The research reported here cannot pinpoint the cumulative effects of these two provisions of the CAAA/ISTEA planning regime in part because it is difficult to judge what *might* have happened but has *not*. Nor can it separate their respective causal influences on decisions. But a number of people interviewed in the study believe that together the emission tests and fiscal constraint requirement are likely to have a significant long-term impact on the culture and outcomes of metropolitan transportation planning.

Effects on Transit, Other TCMs, and Land Use Planning

As Chapter 2 noted, a number of conformity stakeholders, particularly environmental advocacy groups, expected that conformity would promote specific elements of their transportation policy agendas. Among the effects they anticipated were increased transit investments to make service more widely available and convenient, more widespread use of transportation demand management measures to encourage individuals to reduce their reliance on single-occupant vehicles, and tighter coordination of land use and transportation planning to promote development patterns that require less travel. Although these results were not specifically prescribed goals of the Clean Air Act's conformity provision, nor of the 1993 regulations, this study has investigated whether conformity has had an impact on transit, other TCMs, and land use planning.

TRANSIT. Expectations that conformity would increase investments in transit were primarily rooted in the belief that transit projects would provide significant benefits in the conformity emission analysis. It was also thought that the fiscal constraint requirement would help assure that transit projects that were included in transportation plans would secure sufficient funding to go forward. To gauge the impact of conformity, therefore, the study team sought to discover whether and to what degree forecasted emission benefits have influenced transit planning and decision making.

In the 15 study sites, conformity considerations seem to have reinforced – but not determined – transit policies in two areas; but in others, transit planning has been much less affected by conformity. Contrary to the cited expectations, most rapidly growing metropolitan areas in the study, including those that have experienced conformity difficulties, have not found transit's emission benefits sufficient grounds to encourage major investments. However, although conformity has not provided incentives for expanded transit in most study sites, the areas that already have extensive transit networks have found the emission benefits of continued investment helpful in demonstrating conformity.

Denver and Portland are the two study sites in which conformity has, to some degree, affected transit policy. In Denver, conformity has provided additional incentives for developing light rail transit that was already well along in the planning stages prior to promulgation of the regulations. Since the area's PM_{10} problems, localized in the downtown area most efficiently served by transit, could be partially mitigated by light rail, the area's conformity difficulties reinforced its intent to go ahead with this project. The fiscal constraint requirement, along with prodding by a coalition of environmental advocates, has also kept the financial feasibility of proceeding with transit in the forefront of decision makers' considerations, although at the conclusion of the study period the failure of a transit-finance referendum left doubt about how funds would be found.

In Portland, conformity has meshed with and buttressed the area's pioneering growth management policies, including the use of light rail transit to encourage compact urban development. In the late 1980s and early 1990s, to counter a state DOT proposal for construction of the Western Bypass, a suburban circumferential freeway, environmental and transit advocates sought to make an alternative case for extending the area's nascent light rail network. Led by 1000 Friends of Oregon, they initiated the LUTRAQ project, in close cooperation with key regional, state, and federal agencies. LUTRAQ consultants used modeling techniques similar to those subsequently required by the conformity rule to analyze alternative land use and transportation policies for the Portland metropolitan area. As a result of the LUTRAQ analysis, 1000 Friends proposed that light rail transit, rather than the freeway, be built in Washington County, to anchor moderate-density neighborhood development along the right-of-way. The analysis showed that this development, when supported by transportation demand management measures, could accommodate the area growth expected over 20 years. In 1992, Oregon DOT made the LUTRAQ proposal one of the five alternatives

it included in the Major Investment Study (MIS) undertaken on the bypass. Meanwhile, Metro, the Portland MPO, recommended a LUTRAQ-like development plan in its Region 2040 Growth Concept, an initial update of its regional plan. When the MIS, issued in 1995, showed that the LUTRAQ alternative was equal or superior to the Bypass plan in most dimensions, ODOT decided to proceed with less extensive road improvements rather than the Bypass. The Portland area is proceeding with a Westside light rail project and moving to implement other elements of the LUTRAQ vision.[4] While conformity did not generate the LUTRAQ analysis and the regional decisions that have flowed from it, state and regional officials have used the CAAA planning process, including conformity, to expand and lock in these policies through the regulatory process.

Some environmental advocates expected conformity to increase the attractiveness of transit investments in rapidly growing nonattainment areas with high VMT growth rates, most of which have relatively limited transit service. However, in ozone nonattainment areas like Charlotte, Atlanta, Phoenix, and Houston – which are characterized by quite decentralized urban development patterns – even substantial investments in new transit service would produce small changes in transit's overall mode share and thus make only small impacts on the projected net growth of regional emissions. Even the 20-year time horizon of conformity is too brief a period to plan and institute major investments in transportation facilities and services, let alone to see changes in travel behavior play out. Consequently, planners and policy makers, even in the face of the conformity lapses in Charlotte and Atlanta, have not seen transit investments as a major way of dealing with conformity pressures.[5] Moreover, our interview subjects report, when viewed strictly as a way of improving air quality, transit projects often compare poorly in cost-effectiveness to alternative mobile source control measures – such as enhanced I/M or reformulated gasoline. Transit may make sense for other reasons, but air quality alone is not a sufficient motive for large investments. This effect is intensified by the preference in many areas for light rail over bus service, which makes transit even more expensive relative to the air quality benefits it can deliver. Except in Denver (where the geographically concentrated PM_{10} problem creates a special case among the study areas), to the extent that transit is being seriously considered in high growth areas, it is not because emission reduction credits weigh heavily on the decision-making scales. Instead, some in the business community see transit as an economic development stimulus.

The fiscal constraint requirement cuts two ways, moreover. Transit financing difficulties potentially create fiscal constraint obstacles to including major projects in transportation

[4]See Keith Bartholomew, "LUTRAQ to Region 2040: From Citizen Alternative to Official Policy," *Progress* (Washington, D.C.: Surface Transportation Policy Project, March 1997).

[5]In November 1998, however, Charlotte voters did approve a referendum to establish a sales tax increment for transit. During the same election cycle, Georgia gubernatorial candidate Roy Barnes made transit in the Atlanta area a campaign issue. Subsequently elected, he has proposed expanded regional transit service.

plans. Many states have laws that require them to use gas tax revenues only on roads. These areas must then raise money for transit by other means – frequently through sales or other taxes. Transit funding referenda have failed in Denver and Phoenix, and Houston has redirected money from a successful referendum to other municipal purposes. In Maryland the legislature passed a 50% farebox recovery requirement, which has put a damper on provision of any transit services that cannot garner half of their operating expenses from ridership.

While there is scant evidence that conformity has motivated new transit investments, in study areas that have extensive transit networks and ridership (e.g., New York, northern New Jersey, Chicago, Philadelphia, San Francisco, and Boston), there is no question that the transit component of the transportation plan plays a significant role in each area's conformity analysis. These study sites spend substantial portions of their transportation funds on capital maintenance, replacement, and incremental expansion of transit facilities and service. When modeled as part of the regional analysis, such transit projects generally show air quality benefits that partially offset emissions from VMT growth or additional road capacity (or are neutral in air quality effects). In a few cases, moreover, off-model analysis of transit projects (e.g., the purchase of alternative fuel buses in Chicago and replacement buses in Boston) has helped areas pass build/no build tests that might otherwise have proved problematic.

Nonetheless, the individuals interviewed in these study sites did not regard potential emission impacts on the conformity analysis as a significant influence on decision making either in terms of the transit budget share or the types of projects supported. The direction of influence in such cases is from transit to conformity, not the reverse. Because of strong local political demand for transit, it appears that these areas would have spent their money on transit projects anyway. In some cases, interview subjects did note, transit investments became attractive or jumped higher on area priority lists because they qualified for funding under the Congestion Mitigation and Air Quality (CMAQ) program created by ISTEA to promote compliance with CAAA requirements. But this incentive effect was independent of the conformity requirement and would have operated were the latter not in place. In the Chicago and Boston cases referred to above, for example, area planners performing the conformity analysis simply took advantage of bus purchases that had already been decided.

TCMs. While the conformity regulations do not compel areas to include TCMs in their SIPs, conformity does require that TCMs that have been written into SIPs be implemented in a timely fashion; and the regulations protect certain types of TCMs as exempt projects. These provisions, coupled with the expectation that TCMs would show emission benefits, led some to believe that conformity would increase the adoption of TCMs in transportation plans/programs.[6] Conformity, however, does not appear to be having this effect in the study sites. Although many

[6]The section on "Conformity and Air Quality Planning" later in this chapter includes a discussion of the degree to which TCMs have been included in SIPs.

MPOs in the study have adopted TCMs – including traffic flow improvements, park-and-ride lots, and HOV facilities – in transportation plans/programs, interview subjects do not regard conformity as the main impetus for doing so.

Only two areas reported adopting a TCM specifically for conformity purposes. Boston added a noncontroversial CMAQ project to the TIP to pass the build/no-build tests in 1995. In Baltimore, where a new TCM resolved TIP conformity difficulties triggered in 1995 by the status of the ECO program, the situation was far more complex politically. The 1994 Baltimore transportation plan had assumed implementation of the then mandatory federal ECO program. But Baltimore business interests strongly opposed the ECO mandate out of concern that the program would put their region at a competitive disadvantage with the Washington metropolitan area, which was not subject to ECO. Governor Glendening responded to the political pressure in May 1995 by declaring ECO a voluntary program, notwithstanding the federal mandate; and the legislature cut all Maryland Department of Environment (MDE) funding for the program.[7] When the MPO staff nonetheless plugged ECO into the conformity analysis to offset NO_x emissions in future horizon years, MDE expressed discomfort that a program for which it had no funding and no implementation plans was used in the analysis; and the Sierra Club Legal Defense Fund (SCLDF) questioned the claim of full emission credit for a voluntary program. The MPO therefore proposed a regional commuter assistance program (RCAP), to be financed with transportation funds and implemented by the MPO staff in 2005. Because RCAP claimed minimal emission reduction credits and did not rely on MDE for staff or funding, SCLDF and MDE no longer objected to its use in the conformity analysis. The RCAP program, not scheduled for implementation until 2005, has been refined and supplemented in subsequent conformity analyses.

In other areas, the availability of CMAQ funding has probably increased the attractiveness of some TCMs relative to other possible expenditures; and many areas routinely use an off-model analysis of TCMs to pass the build/no-build test. Because most show only modest air quality benefits, however, other factors have driven their inclusion in area plans; they have not been programmed specifically to capture air quality benefits. Indeed, environmental advocacy groups have argued against some of these projects (particularly transportation system management – TSM – projects intended to use existing infrastructure more efficiently), even when MPO modeling shows conformity benefits, on the grounds that by reducing congestion they will ultimately encourage more drivers to use the road. In each of the study sites, restrictive transportation demand management measures that might have large air quality benefits – e.g., various forms of pricing incentives – are regarded as too politically volatile to adopt. Only San Francisco seriously considered – but did not adopt – such policies during the study period.

The adoption of the RCAP program in Baltimore shows that under some circum-

[7]It was not until later in 1995 that Congress passed legislation making ECO voluntary.

stances the conformity regulations can give both external stakeholders and public agencies policy leverage that they might otherwise lack, but a commitment to initiate a voluntary regional program ten years hence is a quite limited outcome. Conformity incentives, moreover, did not prove strong enough to prevent Maryland's elected officials from defying the federal ECO mandate, even though it was a TCM written into a SIP, which therefore required timely implementation under the conformity regulations.

LAND USE PLANNING AND REGULATION. Neither the CAAA nor the conformity rule require that areas consider or adopt land use controls to constrain transportation and thus mobile source emissions. The conformity rule, however, does require the use of a network-based transportation demand model that relates travel demand to land use patterns, as well as demographic and employment trends, transportation infrastructure, system performance, and policies. Some proponents of conformity hoped that modeling the transportation/land use links would also lead to consideration of alternative land use scenarios in the planning process and wider acceptance of land use regulation as a viable policy option for reducing mobile source emissions.

As described in Chapter 4, this requirement spurred transportation modeling enhancements, some of which were targeted specifically at improving MPOs' capacity to forecast the reciprocal impacts of transportation and land use and relate these to air quality. In turn, better information about how land use patterns, transportation facilities and services, and air quality interact over time, has contributed to regional discussion of alternative land use scenarios. In Denver, these issues have gotten substantial public attention. Existing public concern about the consequences of growth increased in response to the area's conformity difficulties and the controversy over the PM_{10} budget. In 1995, newly re-elected Governor Romer kicked-off a year-long "smart growth" campaign that brought together a large group of business and environmental leaders from around the state. Spurred by this initiative and expanding public interest in regional growth issues, DRCOG unveiled its *Metro Vision 2020* plan, which recommended constraining metropolitan growth within a 700 square mile area, protecting open space, and committing to transportation alternatives that would support these land use policies. Although DRCOG lacks policy tools to enforce the plan on local government land use decision makers, its transportation policies have sought to promote growth along the lines proposed in *Metro Vision 2020.* In some other areas – e.g., Milwaukee and Philadelphia – transportation infrastructure plans are intended to support specific land use and development scenarios.

As the Denver example indicates, however, the impact of conformity on actual land use decision making is limited by the distribution of institutional responsibilities and the politics of land use regulation in the 15 study sites. Except in Portland, authority for land use *regulation* is a prerogative of individual municipal or county governments, not the state and regional institutions that largely control transportation and air quality deci-

sions.[8] In other states, municipal and county governments tend to resist efforts by higher level governments to regulate their land use authority. Although federal transportation planning regulations require local governments to be represented on MPO boards, not all municipalities in an area serve; and in no situation is the full set of municipal land use decision makers for a given locality involved. Consequently, the public entities with land use decision making authority are not systematically involved in conformity. In San Francisco, for example, at the urging of a coalition of environmental advocates, MTC modeled a transit-oriented land use scenario. Although this scenario showed significant air quality benefits, MTC rejected it as a plausible basis for transportation decisions, arguing that neither the probable actions of land use regulators nor market trends for the location of residences and economic activity were actually likely to produce the patterns of land use that the scenario presumed. Even in the sphere of land use *planning*, only some of the MPOs in the study sites – e.g., in Atlanta, Denver, Philadelphia, Salt Lake City, Houston, and Milwaukee – are comprehensive planning agencies whose scope of responsibility includes regional land use planning. In a number of areas, land use planning is the province of other entities that are less centrally involved in conformity than the MPO.

Portland is the single major exception. As related above in discussing the LUTRAQ policies, Metro, which is both the regional land use agency and the MPO, has legally buttressed its growth management policies by getting the state air agency to incorporate them into the SIP, which makes them federally enforceable through conformity. By contrast, in most other study sites, land use decisions are only weakly coordinated with transportation planning and air quality regulation; and the government bodies that hold and implement the actual regulatory authority over land use operate quite independently.

Conformity and Air Quality Planning

In examining the impacts of conformity on transportation plans and policy, this chapter has been focusing primarily on the effects of air quality regulation on transportation. But through conformity, transportation has also had significant effects on air quality planning, an outcome that deserves close attention. As intended, conformity links the sequential development of transportation plans and programs through the years, on the one hand, and the similarly sequential preparation of state implementation plans to fulfill CAAA requirements, on the other. In what ways and how well has it done so? This section examines the degree to which conformity has influenced the first post-1990 air quality plans and subsequent SIP planning efforts.

1992 CO and PM_{10} SIPs

Several factors were at play during the start-up phase of CAAA/ISTEA implementation that prevented conformity from having a larger influence on the first round of SIP planning. As

[8]Maryland also has a growth management regulatory system; however, it is much weaker than Oregon's.

discussed in Chapter 4, the timing of the federal conformity regulation's promulgation limited conformity's impact on the initial phase of air quality planning. Transportation and air quality planners were under tremendous pressure juggling the myriad new demands placed on them by the CAAA and ISTEA. Because the conformity regulation was not written until after the submission date for CO and PM_{10} SIPs in late 1992, these plans were developed without knowledge of the regulation's final form or clarity about its implications for SIP planning.

1993 VOC Reduction SIPs

Although the subsequent notice of proposed rulemaking for conformity, issued in January 1993 as the Bush administration was leaving office, alerted some ozone nonattainment areas to the importance of conformity at a relatively early stage of developing their 15% VOC reduction SIPs, the final conformity regulation, developed under the new Clinton administration, was not published until November 1993, a few days after the 15% SIPs were due. Some states were closely attuned to the national discussions about how the conformity regulations should be written[9], while others more passively awaited the final regulations before turning attention to the implications of this new procedure. As a result, the degree to which conformity considerations did influence planning for the 15% SIPs varied widely.

Even in areas where the importance of the issues was clearly appreciated, the delayed release of the final version of 1993 regulations left working-level transportation and air quality planners with an incomplete picture of the requirements that would be placed on them. In a few areas – including Boston, Houston, and Milwaukee – broad-based stakeholder task forces participated actively in SIP planning. In these areas, because an overall SIP strategy was debated, stakeholders, including transportation agencies and interests, came to understand the tradeoffs inherent in selecting specific control measures. They also began to address what would be necessary to bring the area into attainment. Through this process, the forthcoming regulations were conceptually addressed, even though the final conformity requirements were still uncertain.

In some other areas, even though a comprehensive stakeholders process was not convened, the future implications of air quality regulation for transportation were also clearly addressed. In the San Francisco Bay area, the MPO was responsible for drafting the mobile-source elements of the SIP and was broadly experienced with emissions forecasting issues as a result of the litigation of the late 1980s and early 1990s. In Phoenix, where the MPO was also the lead agency for air planning and the state legislature was proactively involved, mobile source issues figured prominently in policy making. In Oregon, a state-level Governor's Task Force on Motor Vehicle Emissions developed strategies that influenced the Portland SIP.

[9]The San Francisco and Denver MPOs, for example, followed these discussions closely. In some states in the study – notably Pennsylvania and New York – state air agencies and DOTs were actively involved but took quite different positions in lobbying nationally on how the conformity provision of the CAAA should be operationalized.

In other areas, however, the air agency dealt separately with the stakeholders in each source category and focused primarily on short-term regulatory requirements. In some of these areas – e.g., Atlanta, Baltimore, Chicago, Milwaukee, New York, and Philadelphia – transportation agencies, concerned about future conformity requirements, made efforts to influence mobile source emission budgets. However, lacking both the need to implement measures beyond those federally mandated and a broad stakeholder forum in which difficult decisions could be discussed, the air agencies chose not to broach directly the politically difficult question of how emission budgets would be allocated over time. In several areas (including Baltimore, Chicago and Milwaukee), air planners nonetheless responded to the transportation agencies' concerns. They explicitly chose to accommodate mobile source growth in their 15% SIP budgets by using liberal VMT growth estimates. These created a future mobile source cushion for SIP purposes as well as for conformity.

Of the 15 study areas, decisions made during this period subsequently created conformity problems for both Charlotte and Salt Lake City, moderate ozone nonattainment areas that decided to seek redesignation to attainment rather than write a 15% VOC reduction SIP. Redesignation was attractive because, as attainment areas, they could avoid implementing some SIP measures that were required in moderate nonattainment areas and could escape the disadvantages faced by nonattainment areas when trying to attract new business locations or expansions. To avoid the penalties associated with a finding of failure to submit the 15% SIP, these areas were under tight time constraints to develop attainment demonstrations and write ten-year maintenance plans. In neither case, however, did transportation and air planners fully probe the inter-relationship of this choice with the emergent conformity regulations.

In Charlotte, transportation planners did too little to explore and call to the attention of air planners the implications of conformity for future transportation policies; and air planners were focused on fulfilling the immediate regulatory requirements for redesignation. As refined transportation demand modeling subsequently showed that VMT growth rates would be significantly higher than anticipated in the maintenance plan, the emission budgets caused the severe conformity difficulties described in Chapter 3.

In Salt Lake City, the MPO realized late in the redesignation process that the maintenance plan mobile source budgets would cause future conformity problems. However, because a CAAA sanctions clock for failure to submit the 15% SIP was about to expire, the MPO supported the maintenance plan and later sought to address the budget problems through a SIP amendment. In both areas, transportation planners eventually came to believe that stationary sources had actively sought a growth cushion in their budgets during bilateral negotiations with the air quality agency. Whether or not the perceptions expressed above are correct, it is clear that transportation planners in these areas were not aware of or engaged enough during the redesignation process to fully understand the future impacts on mobile sources and thus to

make sure that intersectoral tradeoffs were clearly addressed in setting emission budgets.

Effects on Subsequent SIP Planning

As areas have moved through subsequent rounds of air quality and transportation planning, conformity has had more impact on the setting of mobile source budgets. In most areas, transportation planners have been much more involved with the 9% and attainment year budgets, although in several (e.g., Atlanta, Philadelphia and New York City) transportation planners have not been deeply involved in negotiations until after preliminary budgets have been set and transportation agencies must react through comments. In the face of conformity problems some areas have adjusted or amended mobile source budgets. Other areas have proactively reassessed emission budgets to anticipate and deal with looming conformity problems.

Overall, this activity represents a major change in the practice of transportation and air quality planning. Even where bureaucratic relations have been far from smooth, the previously separate planning and regulatory processes have become far more tightly linked than ever before. Just as air planners have become more significant and involved stakeholders in transportation planning – as described in Chapter 4 – transportation planners have become more active stakeholders in air planning.

Conformity has spurred this process in two main ways: (1) by stimulating greater scrutiny of and refinements in the current data and forecasting techniques for transportation demand, and (2) by forcing planners and policy makers to identify, confront, and more directly assess the options they have for reducing mobile source and other emissions. In some areas, this has resulted in refinements of mobile source emission budgets to accommodate transportation needs or, less frequently, adoption of additional control measures to mitigate transportation emissions. In other areas, however, transportation interests have *not* secured the SIP changes they have sought to alleviate conformity problems resulting primarily from higher rates of VMT growth than anticipated. Unresolved differences about how to deal with these problems account for the conformity lapses that existed in Charlotte and Atlanta at the conclusion of the study period. Nonetheless, to a far greater degree than in the past, the implications of transportation growth are being carefully considered in air pollution regulation.

MODELING COMPLICATIONS. The complexity of the modeling process and the interrelationships between conformity and SIP modeling, however, have frequently made it difficult to get to the heart of these issues about transportation growth. As discussed in Chapter 3, passing the emissions budget tests has been the most difficult conformity hurdle. Although VMT growth rates are fundamental to most budget test problems, some difficulties have been caused or exacerbated by modeling issues. These include the reliance on HPMS data for VMT estimates in SIP budgets and the requirements that areas use the latest planning assumptions and the most recent emissions model for the conformity analysis.

When conformity problems are primarily caused by the disparity in modeling techniques, resolving the problems has frequently proved time-consuming but possible for the agencies concerned. However, when the conformity difficulties reflect underlying problems of substantively meeting Clean Air Act mandates rather than modeling artifacts, the process of clearing away the modeling confusion has tended to delay dealing with the basic issues of air pollution reduction.

In the 1993 conformity rule and guidance on VMT forecasting and tracking, EPA, with FHWA concurrence, specified the use of HPMS data as the preferred method for calculating VMT to establish the emissions levels on which SIP budgets are set. However, the conformity rule also required that areas use network-based transportation demand models to generate the VMT forecasts on which emissions estimates are calculated for the conformity analysis. Thus, in some cases, because different methods may have been used to calculate emissions in the budget and analysis years, conformity problems may not be due to actual changes in emissions. Some areas, including Charlotte in 1994, have dealt with this problem by making adjustments in the conformity analysis. Others (e.g., Boston and New Jersey) have chosen to amend their SIP budgets using VMT forecasts from the travel demand models to avert future conformity problems. Three areas (Baltimore, Phoenix and San Francisco) avoided this problem altogether by using VMT estimates from the travel demand models to set the SIP budgets initially.

In addition, the conformity rule requires that areas use the most recent planning assumptions in their conformity analyses. To comply with this requirement, areas have updated their estimates of population, employment and travel for use in the transportation models, significantly refining the parameters that had been used to develop the budgets and thus sometimes "finding" more emissions than were reflected in the budgets. Likewise, the use of updated versions of the MOBILE model increased the estimates of certain emissions, under the same conditions. Thus, if an area used MOBILE 4 to set its budgets and MOBILE 5 in the conformity analysis, an increase in emissions might be due to the difference in the models.

An example of this occurred in Salt Lake City in 1994 when the area's first budget test problems occurred, and the area lapsed after failing to pass the NO_x budget test for PM_{10}. Transportation planners eventually convinced EPA that this failure was not due to real emission increases, but was due to changes in the MOBILE model. The PM_{10} budgets were established using MOBILE 4, prior to the promulgation of the 1993 conformity regulations, while the conformity analysis later used MOBILE 5, which calculated much higher levels of NO_x from mobile sources. With permission from EPA, also granted to a few other areas, Salt Lake City has since continued to use MOBILE 4 for NO_x conformity for PM_{10}.

CHANGING SIPS TO SOLVE CONFORMITY PROBLEMS. All of the areas that have had serious problems passing the budget tests (Atlanta, Charlotte, Denver, Houston, and Salt Lake City) have responded by attempting to alter the modeling underlying mobile source emission budgets or to enlarge the mobile

source share of the aggregate budget to accommodate high VMT growth rates. At the urging of transportation planners, air planners for Atlanta and Charlotte discussed budget amendments, but chose not to alter them. Air agencies did amend the Denver and Salt Lake City budgets and in Houston made technical corrections to a submitted, but not yet approved, budget to solve conformity problems. (For further discussion of these areas' conformity problems, see Chapter 3.) Proactively, Portland established out-year emission budgets in its 1996 ozone maintenance plan to make future conformity determinations less difficult.

Atlanta's budget problems began to emerge as the area updated its modeling assumptions in 1995. When the area could not pass conformity in 1996, planners considered amending the mobile source budgets using modeled VMT estimates rather than HPMS projections. However, they quickly realized that, due to much higher than anticipated VMT growth, if the budgets were revised, the SIP would no longer demonstrate attainment, as the planned measures could not offset the higher emissions levels. Under these circumstances, the area lapsed and is in the process of re-examining SIP budgets and control measures in the attainment demonstration and developing a long-range transportation plan that can conform.

When Charlotte encountered its first conformity problems in 1994, the area attributed the budget test failure to the differences in the methodologies used in the budgets, based on HPMS VMT projections, and the conformity analysis, based on modeled VMT levels. The air agency used a reconciliation technique to make the two methodologies more comparable and thus demonstrated conformity. In subsequent years, new modeling revealed higher than predicted VMT growth rates, making it impossible to demonstrate conformity and leading to a conformity lapse. Efforts to resolve the problem have been complicated by differences over modeling. Transportation planners continued to consider changes to the assumptions on which the budget was based as part of an overall strategy to pass conformity. For example, they weighed the possibility of re-examining some of the default inputs in the MOBILE model, believing that the functional class percentages did not accurately represent the area's vehicle fleet. By the end of the study period, it was clear that modeling changes alone would not resolve the conformity problem. It was not clear, however, how the area could or would address the underlying problem.

As described in Chapter 4, Colorado amended Denver's mobile source PM_{10} budgets to resolve its 1994 conformity lapse. The result was establishment of out-year budgets that increased regionally over time, while emissions in the core area were mitigated to keep them within allowable limits. In addition, the area is required to use dispersion modeling to ensure that the spatial distribution of the emissions does not cause violations of the standard.

In 1995, Utah amended the Salt Lake City budget in its ozone maintenance plan to ease problems passing the NO_x budget test for ozone. By adding ten years to the budget, the area was able to demonstrate that, without adding any additional control measures to the

SIP, NO_x emissions could rise after the first ten years of the maintenance plan without causing a violation of the NAAQS. With the extended, higher budgets, the area could show conformity to the end of the 20-year transportation planning horizon.

In Houston, planners made technical corrections to a submitted (but not yet EPA-approved) budget in 1997 to pass the VOC budget test for ozone. By switching to modeled VMT estimates rather than HPMS VMT and by correcting for an over estimation of VMT on local streets, the area revised the budgets and demonstrated conformity.

In developing its 1996 ozone attainment demonstration/maintenance plan, Oregon took a proactive approach to future Portland conformity determinations by setting emission budgets for ozone precursors for the years beyond the milestone year of the maintenance plan. Quantifying its safety margin between total emissions in the attainment year (1992) and 2006, it gradually allocated part of this safety margin to create somewhat larger mobile source emission budgets for 2010, 2015, and after 2020. This established a budget to accommodate some possible future VMT growth in the area.

As they look ahead to planning for attainment, several other areas expressed the belief that their mobile source budgets will need to be increased. It is unclear, however, how this would occur as overall budgets continue to shrink and areas begin planning for the new NAAQS. A few areas suggested trying to negotiate a shift of emissions from area source budgets to mobile sources, realizing that area sources have been regulated much less than stationary sources in the past and present a much less cohesive and powerful lobby.

Conformity Effects on SIP TCMs

To ensure that nonattainment areas actually implement TCMs written into SIPs, the conformity regulations require that implementation of SIP TCMs proceed according to the schedule in the SIP. Although the conformity rule does not require areas to put TCMs in the SIP, some environmentalists believed that the protection given SIP TCMs would encourage areas to do so. During the initial round of SIP planning, however, conformity proved to be a *disincentive* for inclusion of TCMs in SIPs. Most areas decided that placing TCMs in the SIP would be too risky because delay of a SIP TCM could cause a conformity lapse, jeopardizing the flow of federal funding for all transportation projects. This feeling was especially intense in areas like Boston and Philadelphia that had experienced problems with TCMs in previous SIPs. Given the risks, the small emission reduction benefits of most TCMs, and the reality that reductions from TCMs were not necessary to meet the SIP emission reduction goals or conformity, five of the study areas chose not to include any TCMs in their 15% SIPs or maintenance plans. Most other areas included only a few TCMs, the majority of which were TSM projects that they regarded as certain to be implemented on schedule.[10]

[10]As discussed earlier in this chapter, all areas have included some form of TCMs in their transportation plans/programs, even if they have not written them into SIPs.

There were a few exceptions, however. San Francisco was required, as a result of the MTC suit, to include a number of TCMs in its redesignation request. These were carried forward from its 1982 SIP and were augmented with new TCMs in the contingency plan. In Chicago, planners included more than 100 TCMs in the 15% SIP, believing that any TCMs credited in the conformity analysis should be in the SIP; however, these were primarily traffic flow improvement measures that were deemed certain to stay on track for implementation. In New Jersey, the state DOT proposed including 136 TCMs in the 15% SIP, believing that they would help the area reach its air quality goals. Only later did transportation planners realize that by placing TCMs in the SIP, they helped ratchet the budget down, making conformity more difficult. Although NJDOT originally believed it had included only TCMs that were secure, implementation of some was later held up, with the result that the air agency requested that EPA postpone final approval of the TCMs in the SIP. Now neither the state DOT, nor the air quality agency has any desire to place TCMs in future SIPs.

Portland is the only study area that placed TCMs in the SIP specifically to ensure their implementation. Facing regular challenges in the legislature on the state growth management law, the area included its urban growth boundary and related transit measures in the SIP to protect them from possible changes in the political climate.

Several areas expressed the belief that issuance of promised federal guidance on TCM flexibility would make it much easier to place TCMs in SIPs. Although TCM flexibility was one of the issues raised by stakeholders during deliberations over the amendments to the 1993 conformity rule, EPA determined that a rule change was not necessary to allow areas to substitute a new TCM for one already in an approved SIP. EPA pledged to issue federal guidance on TCM flexibility but had not done so by the end of the study period. Oregon and Texas therefore developed their own state TCM flexibility rules. Air quality planners in Oregon believe that their TCM flexibility provisions were instrumental in gaining the agreements necessary to put TCMs into the SIP. EPA found the Texas rule unapprovable but did approve Oregon's as part of the area's 1996 ozone maintenance plan.

The most dramatic recent effect of conformity on SIP TCMs occurred in Atlanta, which is pursuing a strategy of adding TCMs to the SIP.[11] Also, the air agency planned voluntary ozone action days, both to help demonstrate attainment and to aid conformity. In December 1997, Governor Miller strengthened this measure by signing an executive order that required state employees to reduce single occupant trips by 20% on ozone action days.

Other SIP Impacts

ADDITIONAL CONTROL MEASURES. Although some areas considered the ramifica-

[11]The November 1995 amendments to the 1993 conformity rule allow SIP TCMs to proceed during a lapse. EPA believes that in the future this provision may offset some of the disincentive that the timely implementation requirement creates for placing TCMs in the SIP.

tions of conformity when choosing SIP measures other than TCMs, few adopted mobile source control measures that were not mandated by the CAAA. In Arizona, however, the state legislature, which was deeply involved in selecting the measures that comprised the Phoenix 15% VOC reduction SIP, wanted to offset emissions growth that would occur as the area continued to build highways. Legislators therefore explicitly chose to implement mobile source technology measures more stringent than federally mandated for moderate ozone areas, such as enhanced inspection and maintenance and more stringent Reid Vapor Pressure standards for fuel.

As implementation of the conformity rule progressed, some study areas considered SIP amendments that would expand or strengthen I/M to ease difficulties passing the conformity tests. In Denver, when the area faced conformity problems in 1996, an agreement was reached through interagency consultation to tighten the I/M cut points to make passing conformity easier. By decreasing the amount of NO_x emissions cars would be allowed under the I/M program in 2001, budget test problems for 2015 were resolved. Most areas, however, decided against such a strategy, given the high level of controversy encountered in many states over the I/M program. For example, although the Texas legislature had initially delegated authority to the Governor for decisions regarding the I/M program, it subsequently passed a law that enabled the air agency to expand I/M to additional counties only if they requested to be included in the program. Because none volunteered, consideration of expanded I/M in the Houston area came to a halt.

In Baltimore, although conformity did not influence the initial form or extent of the I/M program, it did help to protect I/M from legislative action that would have made the program voluntary. If the program had become voluntary, EPA would have disapproved the area's SIP, and conformity of the transportation plan/TIP would have been frozen. The governor vetoed the voluntary I/M bill after he was made aware of these ramifications.

In Atlanta, where conformity problems are closely linked with difficulties demonstrating attainment, planners proposed adoption in the SIP of a new mobile source control, "Georgia fuel," which by reducing future emissions would contribute to resolving the area's difficulties.

NO_x TRADES AND WAIVERS. Two study areas, Baltimore and Salt Lake City, considered stationary source/mobile source NO_x trades as a way of dealing with conformity problems; however, neither found it necessary to follow through with their plans. When Salt Lake City faced NO_x conformity problems in 1994 due to the change from MOBILE 4 to MOBILE 5, the area considered a NO_x trade. One of the major stationary sources had recently modernized and, as a result, had a permit for unused emissions. It agreed to sell these outside the area to compensate for the higher mobile source NO_x emissions generated by MOBILE 5 in the conformity analysis. The need for this trade was alleviated when EPA allowed the area to continue using MOBILE 4 for PM_{10} NO_x conformity.

As the Baltimore area faced the aspect of setting its first NO_x budget in 1996, trans-

portation and air quality planners feared that they would have difficulty passing the NO_x budget test. The MPO had just completed a new household travel survey, which was expected to show substantial NO_x increases. The air agency therefore suggested writing a clause in the SIP that would allow it to trade stationary source NO_x credits if it encountered a minor mobile source shortfall in the conformity analysis. The MPO hesitated to agree to this plan and the issue became moot when the new data showed NO_x emissions to be substantially lower than previous levels.

Three study areas, Chicago, Houston and Phoenix, requested NO_x waivers, at least in part to avoid problems with the conformity NO_x build/no-build tests. Chicago and Phoenix were given waivers because they were able to demonstrate that NO_x reductions would not contribute toward their efforts to reach attainment. Houston's NO_x waiver was temporary, pending the outcome of a study to determine whether the area was NO_x limited. When the waiver permanently expired at the end of 1997, the area was uncertain how it would pass future NO_x budget tests.

MITIGATION MEASURES OUTSIDE OF THE SIP. Denver adopted air quality measures outside of the SIP to pass conformity, while avoiding the hurdles of an amendment to add measures to the SIP. As a part of its strategy for dealing with its PM_{10} problems, Denver's MPO negotiated agreements with municipal governments to implement non-regulatory street sanding and sweeping measures that are credited in the conformity analysis, even though they are not in the SIP.